Operational Design Integration Models

Supplement to the 2020 Census Operational Plan

Issued December 2018

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1. Introduction

This document is a supplement to Version 4 of the 2020 Census Operational Plan and includes operational design integration (ODI) artifacts not found in the main body of the 2020 Census Operational Plan or in the Detailed Operational Plans. These ODI artifacts serve multiple purposes. They help to communicate, clarify, and validate the design by bringing together design concepts from related operations. They also help to mitigate design and implementation risks that might result from integration issues that are not apparent when looking at the design of individual operations.

The artifacts presented here focus on high-priority integration areas that are critical to completing the 2020 Census on time and within cost targets and acceptable quality thresholds. The artifacts in this document are as follows:

- Operational Decomposition Model.
- Operational Data Flow Model.
- Planning, Preparation, Execution, and Evaluation Timeline.
- NRFU Administrative Records Contact Strategy.
- Cross-Reference of 2020 Census Operations to Integrated Operations Diagrams (IODs).
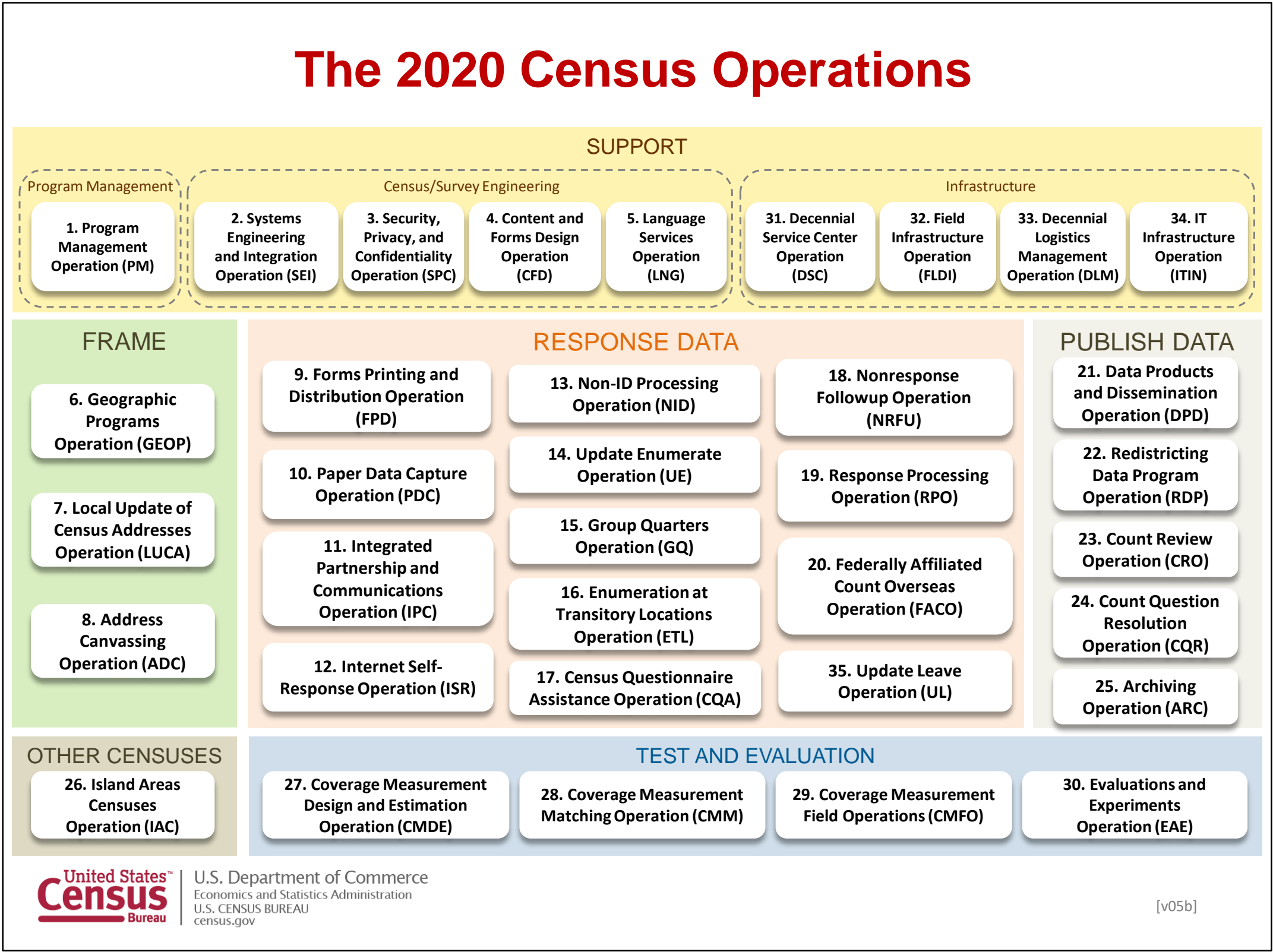- 2020 Census Operations Top-Level Activity Tree.

This supplement includes its own acronym list for the ease of readers.

2. Operational Decomposition Model

The 2020 Census Operational Decomposition Model (see Figure 1 below) shows all 35 of the 2020 Census operations grouped by focus area (Frame, Response Data, etc.). The 2020 Census operation names shown in the figure are used in the titles of the 2020 Census Detailed Operational Plans (DOPs) and include operation reference numbers and operation acronyms that are used for cross-reference purposes in the DOPs and other ODI Models.

The operational focus areas for the 2020 Census operations are as follows:

- **Program Management:** Includes 2020 Census Program Management functions provided by the Program Management operation.
- **Census/Survey Engineering:** Includes operations to support the engineering and integration of 2020 Census IT solutions and the development of 2020 Census questionnaire content and design for data collection questionnaires and supporting materials.
- **Frame:** Includes operations to support the development and maintenance of the 2020 Census address and spatial data used as the underlying geographic framework for data collection and data tabulation activities.
- **Response Data**: Includes operations to support the collection and processing of the 2020 Census response data. Both self-response data collection and field data collection modes are employed. Also includes partnership and communications support activities and activities to support collection of overseas count data.
- **Publish Data:** Includes operations to create and disseminate 2020 Census data products including products for apportionment and redistricting. Also provides support for count review activities, the count question resolution process, and archiving.
- **Other Censuses**: Includes the Island Areas Censuses operation to collect response data for residents of American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the U.S. Virgin Islands.
- **Test and Evaluation:** Includes Post-Enumeration Survey operations activities to support Census Coverage Measurement. Also includes operations support for 2020 Census evaluations, assessments, and experiments work.
- **Infrastructure:** Includes operations for field infrastructure support and logistics management, as well as IT infrastructure operations and staff support.

The 2020 Census Operations

SUPPORT

Program Management

1. Program Management Operation (PM)

Census/Survey Engineering

2. Systems Engineering and Integration Operation (SEI)

3. Security, Privacy, and Confidentiality Operation (SPC)

4. Content and Forms Design Operation (CFD)

5. Language Services Operation (LNG)

Infrastructure

31. Decennial Service Center Operation (DSC)

32. Field Infrastructure Operation (FLDI)

33. Decennial Logistics Management Operation (DLM)

34. IT Infrastructure Operation (ITIN)

FRAME

6. Geographic Programs Operation (GEOP)

7. Local Update of Census Addresses Operation (LUCA)

8. Address Canvassing Operation (ADC)

RESPONSE DATA

9. Forms Printing and Distribution Operation (FPD)

10. Paper Data Capture Operation (PDC)

11. Integrated Partnership and Communications Operation (IPC)

12. Internet Self-Response Operation (ISR)

13. Non-ID Processing Operation (NID)

14. Update Enumerate Operation (UE)

15. Group Quarters Operation (GQ)

16. Enumeration at Transitory Locations Operation (ETL)

17. Census Questionnaire Assistance Operation (CQA)

18. Nonresponse Followup Operation (NRFU)

19. Response Processing Operation (RPO)

20. Federally Affiliated Count Overseas Operation (FACO)

35. Update Leave Operation (UL)

PUBLISH DATA

21. Data Products and Dissemination Operation (DPD)

22. Redistricting Data Program Operation (RDP)

23. Count Review Operation (CRO)

24. Count Question Resolution Operation (CQR)

25. Archiving Operation (ARC)

OTHER CENSUSES

26. Island Areas Censuses Operation (IAC)

TEST AND EVALUATION

27. Coverage Measurement Design and Estimation Operation (CMDE)

28. Coverage Measurement Matching Operation (CMM)

29. Coverage Measurement Field Operations (CMFO)

30. Evaluations and Experiments Operation (EAE)

United States Census Bureau

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U.S. CENSUS BUREAU
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Figure 1: 2020 Census Operational Decomposition Model

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3. Operational Data Flow Model

The 2020 Census Top-Level End-to-End (E2E) Operational Data Flow diagram (Figure 2 following the narrative below) illustrates a notional model for end-to-end data interactions among the 2020 Census operations relating to frame management, data collection, and data dissemination work.

The role and contributions for each 2020 Census operation depicted in the diagram (e.g., GEOP, LUCA, etc.) are discussed below. The numbers in parentheses in the discussions below (e.g., 1,2,3 or 11,12) refer to the time-related stages of the 2020 Census E2E data flow depicted on the data flow arrows in the diagram.

The discussions below refer to four main Data Subject Areas for census data. These include:

- **Frame Data Subject Area:** Includes the address and spatial data used as the underlying geographic framework for data collection and data tabulation activities.

- **Case Data Subject Area:** Includes enumeration case universe data and case status data used to provide operational workloads for data collection operations and guide response data collection work through completion.

- **Response Data Subject Area:** Includes respondent-provided enumeration data collected through self-response, field operations work, or other means.

- **Data Products Subject Area:** Includes Census data products derived from the Frame and Response data collected during the 2020 Census.

Where indicated, the Data Subject Areas are noted in *Italics* in the discussions below. The descriptions for specific data flows in the discussions below use the same capitalized label text (e.g., "Final Collection and Tabulation Universes") as is provided in the diagram.

Frame Operations:

- **GEOP: Geographic Programs Operation**
  - Maintains the 2020 Census *Frame* data (address and spatial data) and manages census geographic *Frame* data updates and MAF/TIGER[1] databases for ADC and LUCA (1,2,3), Pre-Data Collection Phase Response Processing Operation (RPO) (4), Working MAF for Enumeration work (4,6,8,10), and Final Collection and Tabulation Universes (11,12).
- **LUCA: Local Update of Census Addresses Operation**
  - Provides mechanisms for LUCA Outreach, Review, and Returns processes (1,2), and LUCA Feedback and Appeals processes (3,4) and provides *Frame* data update results to GEOP (1,2,6,8).
- **ADC: Address Canvassing Operation**
  - Performs In-Office Address Canvassing, MAF Coverage Study (MAFCS), and In-Field Address Canvassing work (1,2,3), and provides *Frame* data update results to GEOP (1,2,3).

Response Data Operations:

- **IPC: Integrated Partnership and Communications Operation**
  - Informs the public about the 2020 Census during the Pre-Data Collection (5), Data Collection (6,7,8,9,10), and Post-Data Collection Phases (11,12) to influence public knowledge and promote 2020 Census response.
- **RPO: Response Processing Operation**
  - Supports Universe Creation (UC) and ongoing Universe Management (UM) functions for *Case* data, as well as Geographic Data Integration (GDI) functions for Address data updates, and Response Data Integration (RDI) and Decennial Response Processing (DRP) functions for *Response* data. *Case* data for the Pre-Data Collection Phase includes Initial Enumeration Universe (4,5). *Case* data for the Data Collection Phase includes Working Enumeration Universe (6,7,8,9,10). *Response* data for the Post-Data Collection Phase includes Final Enumeration Response Data files (Decennial Response File (DRF), Census Unedited File (CUF), and Census Edited File (CEF)) (11,12).
- **NID: Non-ID Processing Operation**
  - Supports Real-Time Non-ID processing for both Internet Self-Response (ISR) and Census Questionnaire Assistance (CQA) (7) and Post Real-Time Non-ID processing for RPO (8).
- **FPD: Forms Printing and Distribution Operation**
  - Receives Enumeration *Case* data (address lists) (5,6,8) and prints paper notices and forms and distributes to potential respondents via United States Postal Service (USPS) (6,8).
- **UL: Update Leave Operation**
  - Receives *Frame* and *Case* data, including Basic Collection Unit (BCU) lists and associated address lists (6), performs block canvassing for address list validation/update, and distributes paper questionnaire packages to eligible addresses. UL cases then become self-response cases eligible for ISR and CQA response (7) and Nonresponse Followup (NRFU), if necessary. Forwards collected UL *Case* Status data (BCU completion status and case/questionnaire ID linkage info) and Address Adds, Updates, and Deletes to RPO (7).
- **UE: Update Enumerate Operation**
  - Receives *Frame* and *Case* data including Basic Collection Unit (BCU) lists and associated address lists (6), performs block canvassing for address list validation/update, and collects *Response* data from UE respondents. Forwards collected Paper UE Response forms to PDC (7) and forwards *Case* Status data and Address Adds, Updates, and Deletes to RPO (7). NOTE: UE includes Remote Alaska data collection, which collects Remote Alaska Group Quarters (GQ) and Transitory Location (TL) response data in addition to Housing Unit (HU) responses.
- **PDC: Paper Data Capture Operation**
  - Receives respondent self-completed Paper Response forms (7), as well as UE, GQ, and ETL Paper Response forms (7), and forwards *Response* data and *Case* Status data captured from the forms to RPO (7).

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[1] Master Address File/Topologically Integrated Geographic Encoding and Referencing system

- **ISR: Internet Self-Response Operation**
  - Receives *Response* data from ID and Non-ID Respondents via the Internet (7) and from CQA agents on respondents' behalf (7) and forwards *Response* data and *Case* Status data to RPO (7). Uses Real-Time Non-ID (NID) to resolve addresses for Non-ID Respondent cases if possible (7) and provides Address data to RPO for unresolved Non-ID cases.
- **CQA: Census Questionnaire Assistance Operation**
  - Receives *Response* data from ID and Non-ID Respondents via telephone Call Center interaction (7) and allows CQA agents to enter responses on respondents' behalf via the ISR instrument (7). Conducts Outbound Calling Operations on behalf of NRFU Coverage Improvement (CI) activities and forwards CI *Response* data and CI *Case* Status data (7) to RPO.
- **GQ: Group Quarters Operation**
  - Receives *Case* data (GQ address list) (6), collects GQ Advance Contact information and GQ respondent *Response* data, forwards completed Paper GQ Response forms to PDC (7), and forwards GQ electronic *Response* data, *Case* Status data, and Address Adds, Updates, and Deletes to RPO (7).
- **ETL: Enumeration at Transitory Locations Operation**
  - Receives *Case* data (TL address list) (6), collects TL Advance Contact information and Transitory Unit (TU) respondent *Response* data, forwards completed Paper ETL Response forms to PDC (7), and forwards *Case* Status data and Address Adds, Updates, and Deletes to RPO (7).
- **NRFU: Nonresponse Followup Operation**
  - Receives *Case* data from RPO to provide identity of nonresponding addresses (NRFU Cases) (9) that require determination of housing unit status and enumeration at occupied housing units for which a 2020 Census response was not received. Performs Field Verification (FV) as needed to validate Non-ID addresses from RPO (FV Cases) (9). Forwards resulting *Response* data and *Case* Status data and Address Adds, Updates, and Deletes to RPO (10).
- **FACO: Federally Affiliated Count Overseas Operation**
  - Obtains, from their corresponding Federal Agencies, counts by home state of U.S. military and federal civilian employees stationed or assigned overseas and their dependents living with them and provides these counts to DPD (12) for inclusion in the 2020 Census apportionment counts.

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Publish Data Operations:

- **DPD: Data Products and Dissemination Operation**
  - Uses data from RPO, FACO, and GEOP (12) to prepare 2020 Census Data Products. These various *Data Products* are used by subsequent operations and are delivered to the White House and the States and made available to the public.
- **RDP: Redistricting Data Program Operation**
  - Provides RDP Block Boundary Suggestion Project (1) and RDP Voting District Project (2) *Frame* data inputs to GEOP and uses *Data Products* from DPD and *Frame* data from GEOP (12) to provide redistricting data tabulations to each state.
- **CQR: Count Question Resolution Operation**
  - Uses *Data Products* from DPD (12) and supporting *Response* data from RPO and *Frame* data from GEOP (12) to perform the count question resolution process. Provides final counts to DPD (12).
- **CRO: Count Review Operation**
  - Uses *Frame* data from GEOP (6,8) to support the initial Federal-State Cooperative for Population Estimates (FSCPE) HU and GQ Address Reviews. Uses *Case* Status data from RPO to support the FSCPE GQ Post-Enumeration Review (8) and *Response* data to support the Post-Data Collection Phase 2020 Census Count and File Review (11).
- **ARC: Archiving Operation**
  - Uses *Response* data from RPO (12), questionnaire image data from PDC (12), *Data Products* from DPD (12), and geographic *Frame* data from GEOP (12) to provide permanent 2020 Census records to NARA. Also collects and archives internal 2020 Census records for data retention purposes.

Test and Evaluation Operations:

- **EAE: Evaluations and Experiments Operation**
  - Receives *Case* data (address lists for EAE experimental treatments) from RPO (5) and generates mailing materials for experimental data collection treatments for these addresses. EAE respondents use these mailing materials in the same way as other ID respondents receiving materials from FPD and UL (i.e., for mailback of Paper Response forms to PDC, Internet Response through ISR, or Telephone Response through CQA). Collected EAE *Response* data and *Case* Status data are provided to RPO (10) by PDC, ISR, and CQA using the same mechanisms as used for other data collection work.
- **Post-Enumeration Survey Operations**
  - Uses *Response* data from RPO (12) and geographic *Frame* data from GEOP (12) to help identify matches and nonmatches between the 2020 Census data and the data collected as part of the 2020 Census Post-Enumeration Survey.

2020 Census Focus Areas Not Depicted:

- Support (Program Management, Census/Survey Engineering, Infrastructure).
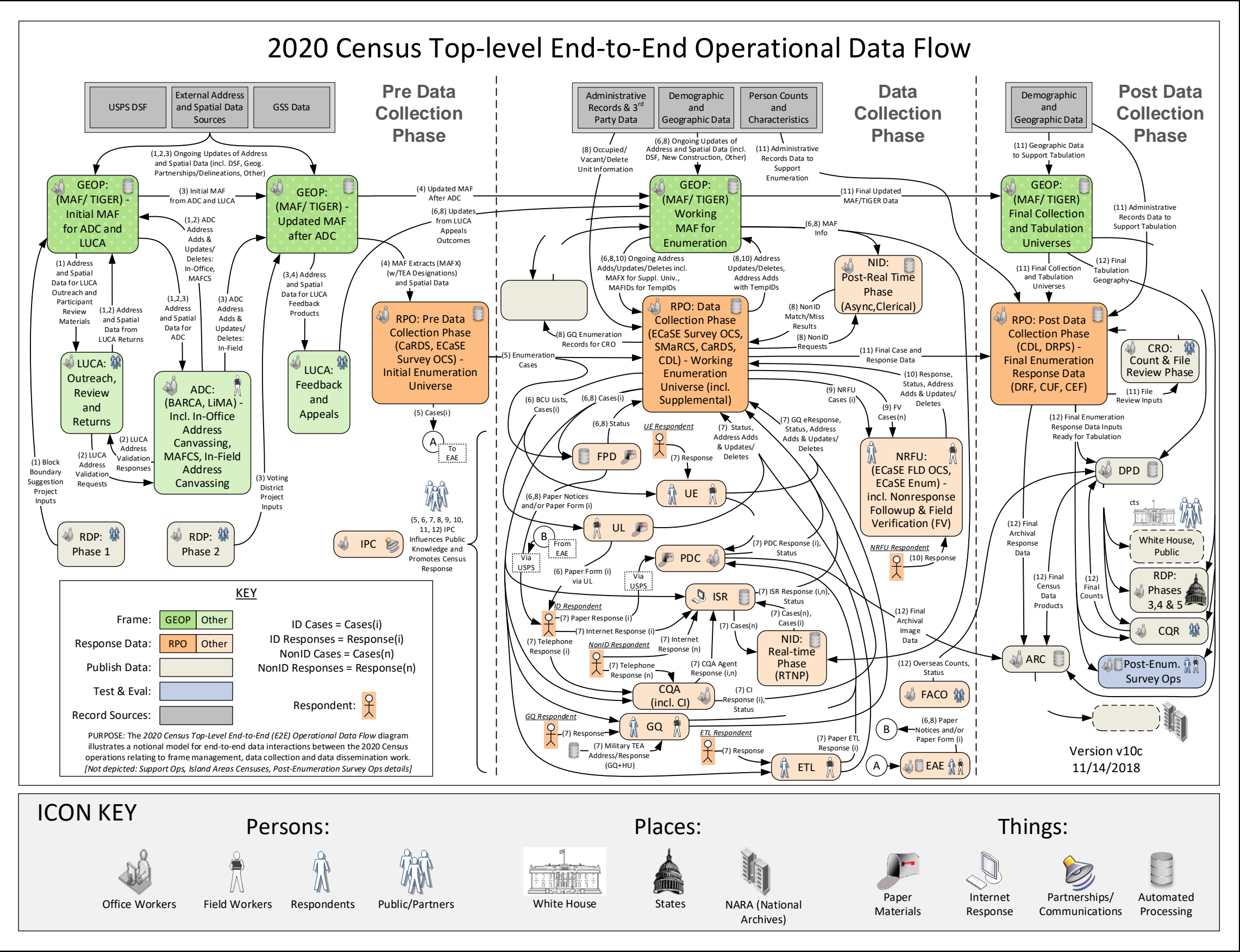- Other Censuses (Island Areas Censuses).

2020 Census Top-level End-to-End Operational Data Flow

Figure 2: 2020 Census Top-Level End-to-End Operational Data Flow

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4. Planning, Preparation, Execution, and Evaluation Timeline

This section includes three timeline charts that provide a visual representation of the order, sequence, and timing of the key milestones and activities related to planning, preparation, execution, and evaluation of the 2020 Census. The three charts (figures) cover different areas of focus. The charts have milestones and activities organized and marked with the same color under summary elements labeled as bands. The charts are:

- **Planning and Preparation:** (See Figure 3 below.) Includes the milestones and activities associated with planning for the 2020 Census and obtaining necessary clearances (Band 1), performing non-field work associated with preparing the address frame for data collection (Band 2), and creating the infrastructure (offices and staff) needed to perform the field work as well as closing offices and outprocessing staff once the work is completed (Band 3).
- **Production Data Collection:** (See Figure 4 below.) Includes milestones and activities associated with the field work required to collect the data, including in-field address canvassing (Band 4), the creation and management of the data collection universe (Band 5), informing the public about the 2020 Census and providing information for self-response (Band 6)**,** major data collection operations for housing unit self-response and nonresponse followup (Band 7), data collection for other types of living quarters and situations (Band 8), and post-data collection processing and data products creation (Band 9).
- **Other Censuses and Test and Evaluation:** (See Figure 5 below.) Includes milestones and activities associated with the Island Areas Censuses (Band 10), the Post-Enumeration Survey (Band 11), and evaluations and experiments conducted during and after the 2020 Census (Band 12).

Most dates on these timeline charts are from the *2020 Census Detailed Timeline*, dated November 30, 2018. Dates for MAF extracts not covered in the *2020 Census Detailed Timeline* are from the *Customer Requirements Document, 2020 Census Address Products, Version 1.0*, dated September 24, 2018. Other planning documents, including the 2020 Census Integrated Master Schedule, Detailed Operational Plans for specific operations and the milestones in Section 5 of Version 4 of the *2020 Census Operational Plan*, also served as sources for some dates. Dates are subject to change as the schedule continues to be refined.

The operation responsible for completing the milestone or conducting the activity appears to the left of the milestone/activity. The milestone/activity dates appear to the right of the milestone/activity markers. Refer to Section 2 or the list of acronyms at the end of this supplement for the full names of the 2020 Census operations.

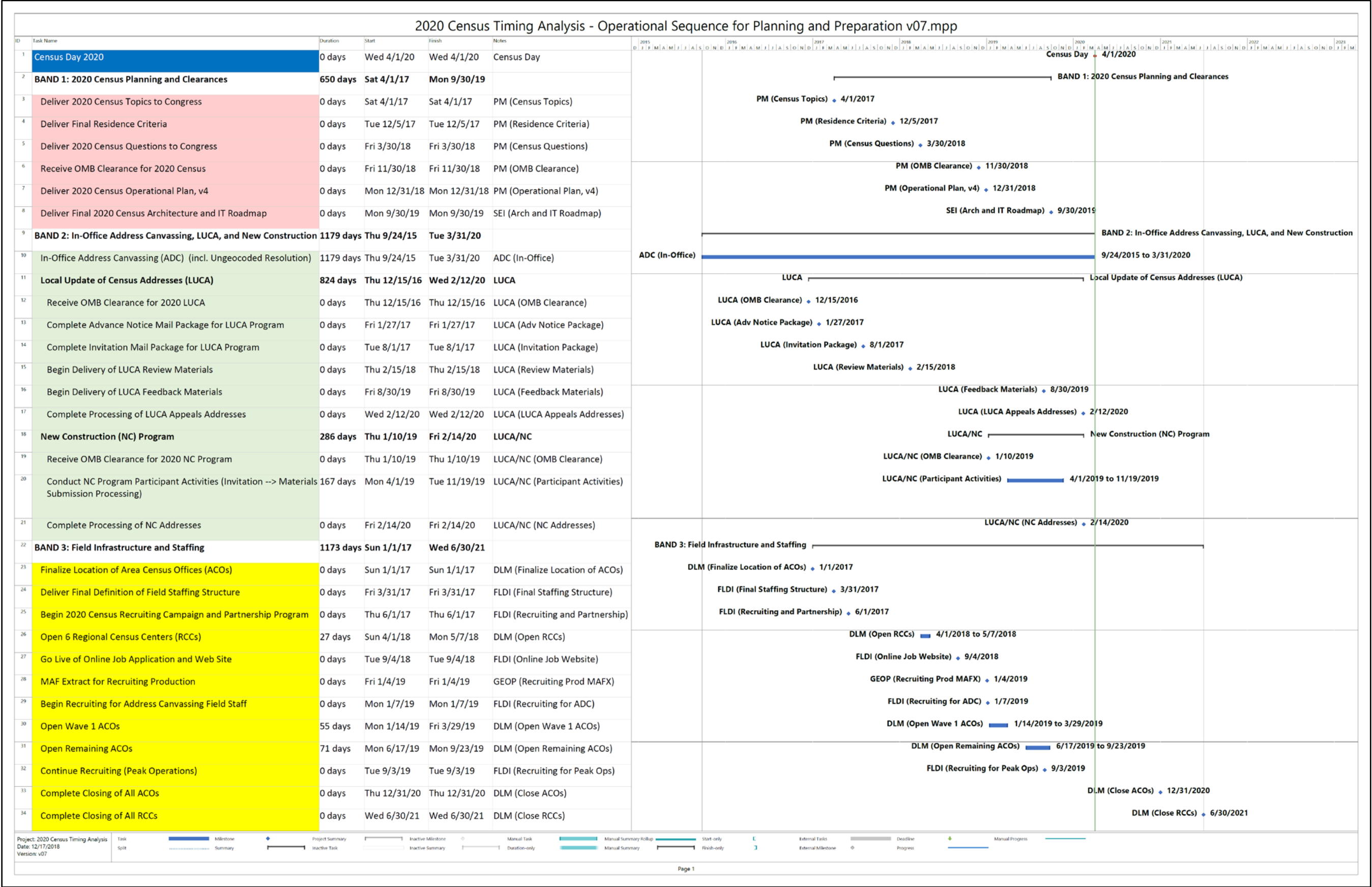[This page intentionally left blank]

Figure 3: Milestones and Activities for 2020 Census Planning and Preparation
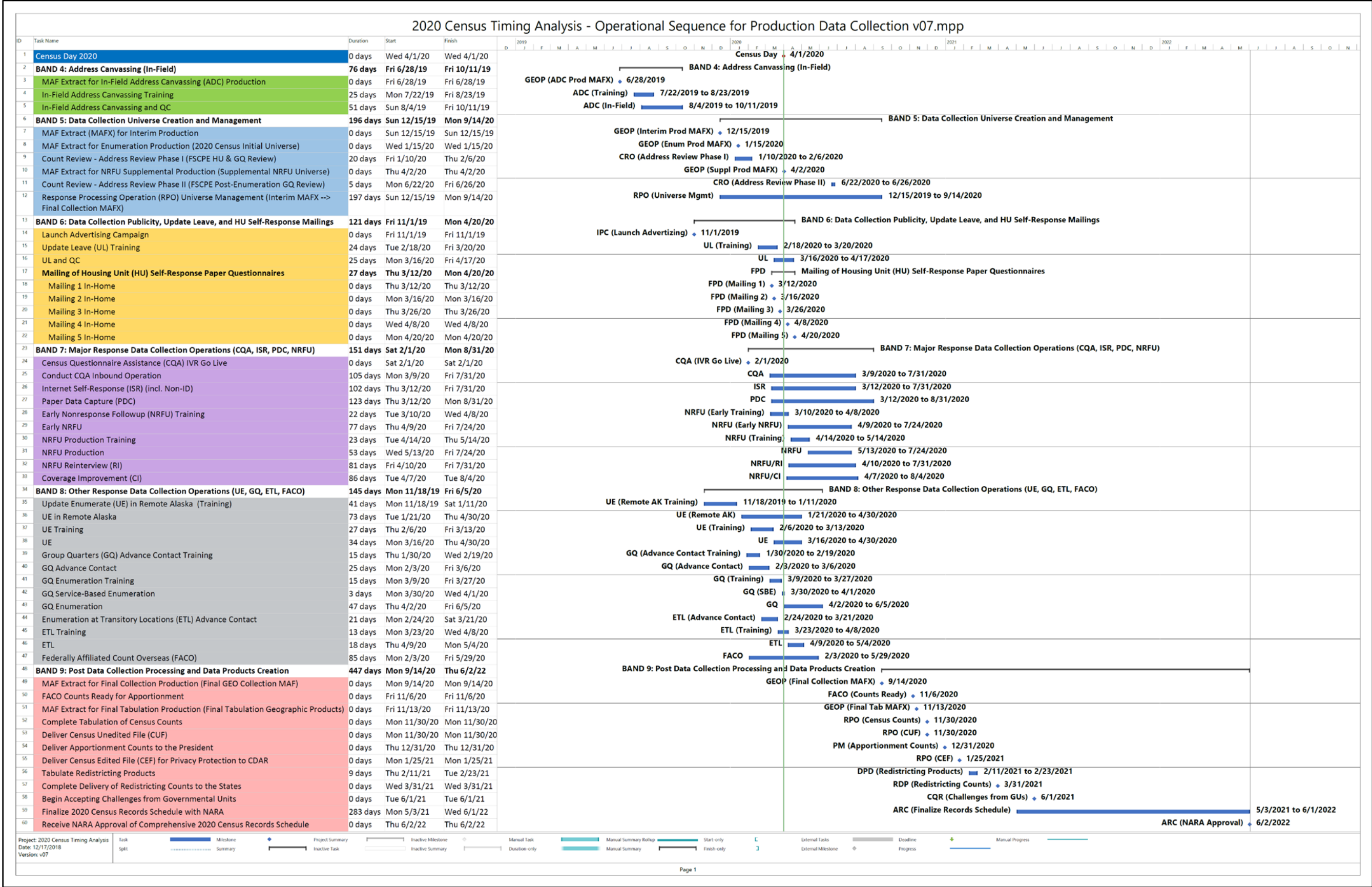
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Figure 4: Milestones and Activities for 2020 Census Production Data Collection
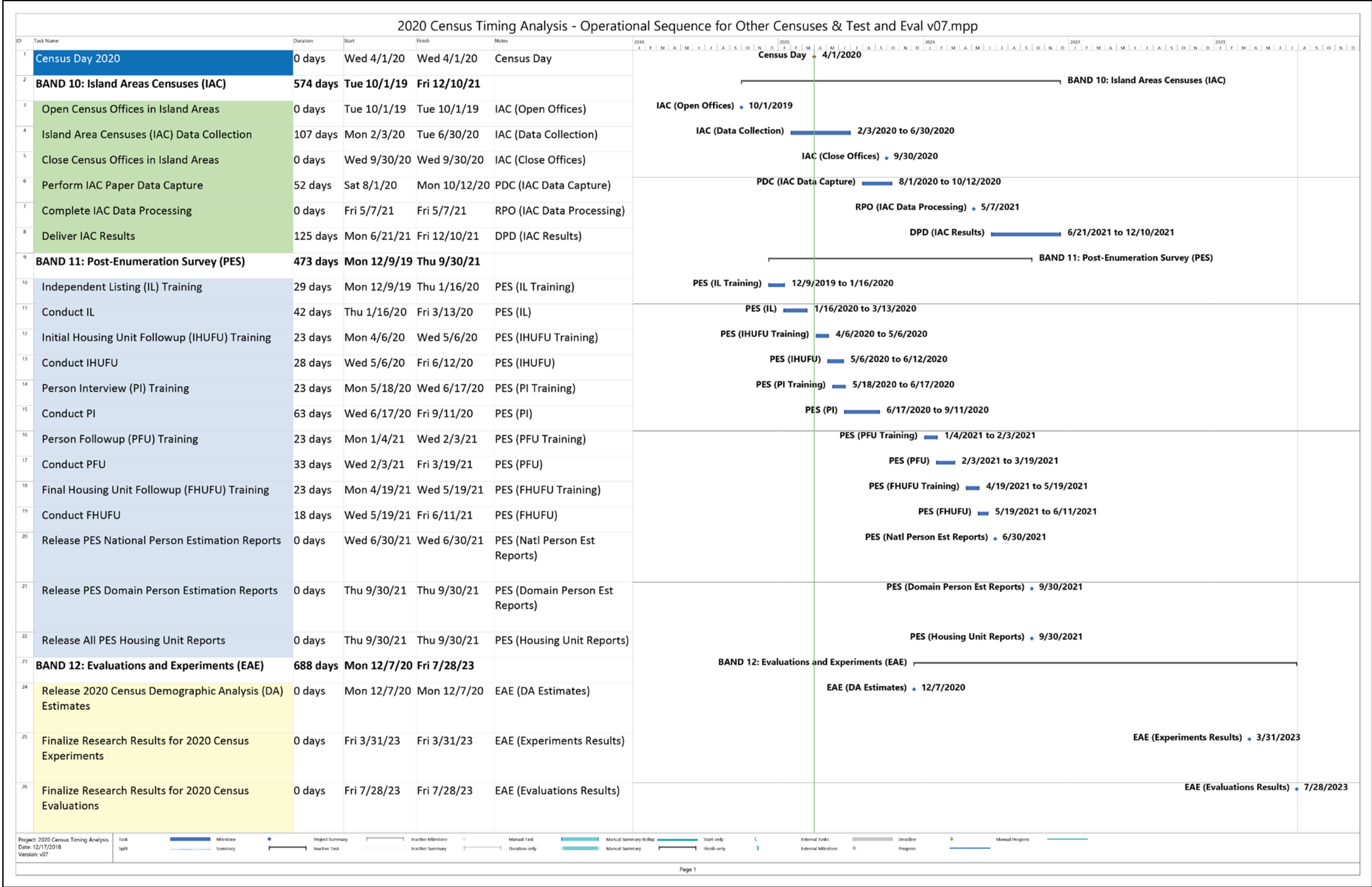
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Figure 5: Milestones and Activities for Other Censuses and 2020 Census Test and Evaluation

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5. NRFU Administrative Records Contact Strategy

One of the four innovation areas for the 2020 Census design is the use of Administrative Records and Third-Party Data (AR) to reduce field workload. To this end, the Census Bureau has developed a set of logistic regression models that draw upon a variety of AR data to reduce the field workload associated with the Nonresponse Followup operation (NRFU). These models serve two primary roles:

- Determine housing unit (HU) status after one visit.
- Provide household enumeration data for selected HUs for which high-quality AR data exist and which cannot be enumerated after one visit.

Figure 6 (below, following the narrative explanation) shows the NRFU contact strategy for the 2020 Census and the role of AR in this strategy. The numbers shown in the black and gold circles in the figure provide a guide for the discussion points found in the narrative explanation.

Note: The black circles are associated with self-response, whereas the gold circles are associated with NRFU.

1 The figure below starts with the self-response phase of the data collection, during which HUs are provided an opportunity to respond. How a HU is contacted during self-response affects how the AR models handle that unit. NRFU covers nonresponding addresses in the two Type of Enumeration Areas (TEAs)[2] that are expected to self-respond: TEA 1 and TEA 6. Addresses in TEA 1 (the bulk of addresses) receive up to five mailings that include a combination of letters, postcard reminders, and paper questionnaires aimed at encouraging people to self-respond. Addresses in TEA 6, which covers areas where most HUs have limited mail delivery capabilities, are visited through the Update Leave operation, during which the lister leaves a questionnaire packet at the door. HUs in TEA 6 that can receive mail receive two reminder mailings. Together, TEA 1 and TEA 6 cover approximately 99 percent of the addresses in the 2020 Census Master Address File (MAF).

2 The AR models are run on all addresses, assigning each address one of four possible statuses: AR Vacant, AR Non-Existent, AR Occupied, or Full Contact. The AR modeling uses U.S. Postal Service Undeliverable As Addressed (UAA) information based on two mailings. For those HUs in TEA 1, the modeling uses the UAA information from the second and third mailings. For HUs in TEA 6 that can receive mail, the modeling uses the UAA information from both mailings. Any HUs in TEA 6 that cannot receive mail will not be assigned an AR Vacant or AR Non-Existent status. Although not shown on the diagram, the AR models are run at least one additional time during NRFU to reflect the most current AR data available.

3 When NRFU begins, the operational control system creates the NRFU Universe (i.e., addresses in TEA 1 and TEA 6 that have not yet self-responded).

4 Nonresponding addresses that have been assigned a status of AR Vacant or AR Non-Existent are sent one additional mailing. The UAA information from this mailing is used later in the process (see number 6 below).

5 At the same time, an attempt is made to enumerate all HUs in the NRFU Universe. If this first attempt is successful (i.e., the enumerator determines the status of the HU [vacant, non-existent, or occupied] and, if occupied, enumerates the unit), then the case is resolved and considered *Resolved with Field Visit*.

6 If the first attempt is unsuccessful, the HU does not appear to be occupied, and the address has a status of AR Vacant or AR Non-Existent, then the UAA information from the additional mailing sent to all NRFU AR Vacant and AR Non-Existent addresses is checked. If the mailing is UAA, then the address is recorded as vacant or non-existent, considered *Resolved as Vacant or Non-Existent*, and receives no additional visits. If the address is not UAA (i.e., the UAA information indicates that the

mailing was successfully delivered, contradicting the AR modeling results), then the HU becomes subject to the full NRFU contact strategy and additional attempts are made (see number 8 below).

7 If the first attempt is unsuccessful and the address has a status of AR Occupied, then—regardless of whether the HU appears to be occupied—an additional mailing is sent to this address to encourage self-response. In the absence of a self-response, the address is enumerated using AR data and considered *Resolved with AR Data*.

8 If the first attempt is unsuccessful, additional attempts are made to enumerate at the HU under three circumstances: (1) if the HU appears to be occupied and does not have a status of AR Occupied (i.e., it has a status of AR Vacant, AR Non-Existent, or Full Contact); (2) if the HU does not appear to be occupied and has a status of AR Vacant or AR Non-Existent and the mailing to the address is not UAA (see number 6 above); and (3) if the HU does not appear to be occupied and the address has a status of Full Contact (i.e., it does not have a status of either AR Vacant, AR Non-Existent, or AR Occupied). In all three cases, additional enumeration attempts are made until an attempt is successful or the maximum number of attempts has been reached. A successful attempt is considered *Resolved with Field Visit*.

9 The last two weeks of NRFU are considered the NRFU Closeout Phase. At this point, the AR statuses of all addresses remaining unresolved after the maximum number of attempts are reassessed using a relaxed quality threshold. Reassessed addresses with a status of AR Vacant or AR Non-Existent are recorded as vacant or non-existent and considered *Resolved as Vacant or Non-Existent*. Reassessed addresses with a status of AR Occupied are enumerated using AR data and considered *Resolved with AR Data*.

10 Those addresses that—even with the lower threshold—cannot be assigned a status of AR Vacant, AR Non-Existent, or AR Occupied, are subject to additional attempts to enumerate that continue either until an attempt is successful or the NRFU operation has ended.

11 Any addresses that cannot be successfully enumerated by the end of NRFU are considered *Unresolved*. The results for these addresses are imputed.

12 Self-response data collection continues during NRFU. The response data from the self-responses received are used in place of the results from the AR modeling or AR enumeration (provided they meet the criteria for a sufficient response).

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[2] The Census Bureau creates TEAs to determine the most effective way to enumerate different parts of the country. Different operations are responsible for listing and enumerating the various TEAs.

Figure 6: NRFU Administrative Records Contact Strategy
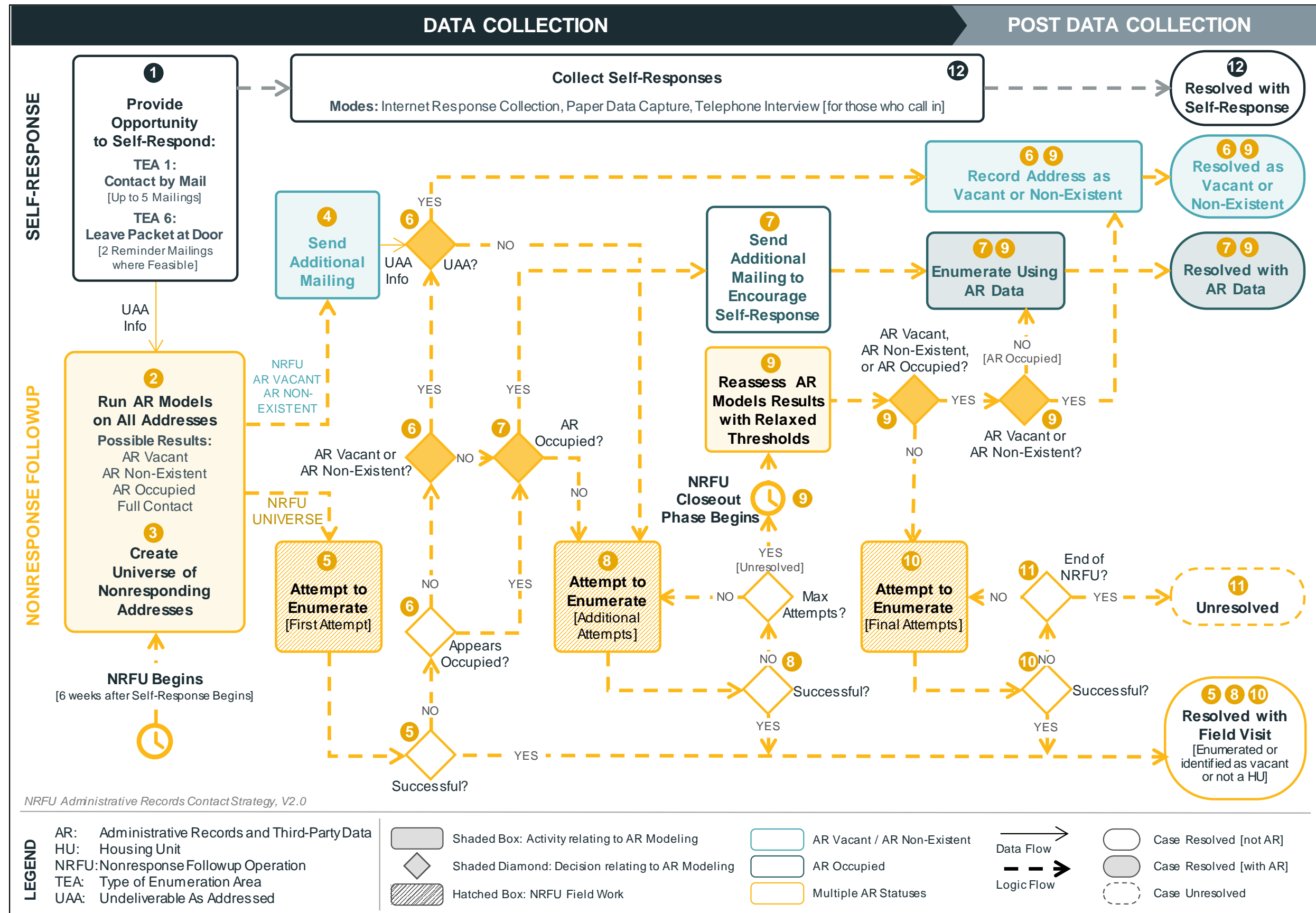
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6. Cross-Reference of 2020 Census Operations to Integrated Operations Diagrams (IODs)

Integrated Operations Diagrams (IODs) depict the major interactions among a selected set of related operations for a given topic. IOD material contains a figure and explanatory narrative text. IODs are found in Section 2 of most Detailed Operational Plans (DOPs) under a heading referencing data flows and operational influences. Table 1 below lists the 2020 Census operations and cross references them to the IODs found in the DOPs. The operations in the table appear in numerical order except for Update Leave operation (UL), which is included with the Response Data operations. The table displays which IODs mention what operation. The table also displays which operations include a particular IOD in their DOP, as well as which DOP(s) contain the most current information for an IOD.

The table's key is:

- I = IOD is included in this operation's DOP.
- R = This operation's DOP contains the most recent IOD and is a recommended source for this IOD.
- X = Operation is mentioned in this IOD but the IOD is not in the operation's DOP.

The recommended version of each IOD provides the source for included operations. The cross-reference determination of what DOP is a recommended source was compiled based on published DOPs as of December 2018, supplemented by internal information. The table does not reflect an I or R for any planned inclusion of an IOD for an operation with a DOP which is at the design stage or earlier as of December 2018.

There are currently five 2020 Census IODs, including:

- Frame Development IOD.
- Data Collection IOD.
- Data Products and Archiving IOD.
- Field Support IOD.
- Island Areas Censuses IOD.

The DOP for Post-Enumeration Survey (PES) (also known as Coverage Measurement) operations, which is planned for release in 2019, will contain a PES IOD. The Integrated Partnerships and Communications IOD will no longer exist when the related DOP is published as version 2, so it has been removed from the list above.

Table 1: Cross-Reference of 2020 Census Operations to Integrated Operations Diagrams (IODs)

Operations and Integrated Operations Diagrams (IODs) Key: I = IOD is in this operation's Detailed Operational Plan (DOP) R = This operation's DOP is a recommended source for this IOD X = Operation is mentioned in this IOD	*Frame Development IOD*	*Data Collection IOD*	*Data Products and Archiving IOD*	*Field Support IOD*	*Island Areas Censuses IOD*
Program Management Operations					
1. Program Management Operation (PM)			X		
Census/Survey Engineering Operations					
2. Systems Engineering and Integration Operation (SEI)					
3. Security, Privacy, and Confidentiality Operation (SPC)					
4. Content and Forms Design Operation (CFD)				X	X
5. Language Services Operation (LNG)					
Frame Operations					
6. Geographic Programs Operation (GEOP)	I[3]	X	X	X	X
7. Local Update of Census Addresses Operation (LUCA)	I, R				
8. Address Canvassing Operation (ADC)	I			X	
Response Data Operations					
9. Forms Printing and Distribution Operation (FPD)		I, R	X	X	X
10. Paper Data Capture Operation (PDC)		X[4]	X		X
11. Integrated Partnership and Communications Operation (IPC)			X	X	
12. Internet Self-Response Operation (ISR)		I			
13. Non-ID Processing Operation (NID)		I			
14. Update Enumerate Operation (UE)	X	I, R		X	
15. Group Quarters Operation (GQ)	X	I		X	
16. Enumeration at Transitory Locations Operation (ETL)	X	I		X	

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[3] When the version 2.0 GEOP/GD DOP is available, it will carry the most recent version of the Frame Development IOD.

[4] PDC DOP version 1.0 (March 31, 2017) has a placeholder for the Data Collection IOD. When a version 2.0 PDC DOP is published, it will carry the most recent version of the Data Collection IOD.

Operations and Integrated Operations Diagrams (IODs) Key: I = IOD is in this operation's Detailed Operational Plan (DOP) R = This operation's DOP is a recommended source for this IOD X = Operation is mentioned in this IOD	Frame Development IOD	Data Collection IOD	Data Products and Archiving IOD	Field Support IOD	Island Areas Censuses IOD
17. Census Questionnaire Assistance Operation (CQA)		I			
18. Nonresponse Followup Operation (NRFU)	X	I		X	
19. Response Processing Operation (RPO)	X	X[5]	X		X
20. Federally Affiliated Count Overseas Operation (FACO)			I, R		
35. Update Leave Operation (UL)	X	I		X	
Publish Data Operations					
21. Data Products and Dissemination Operation (DPD)	X	X	I, R		X
22. Redistricting Data Program Operation (RDP)	I, R		I		
23. Count Review Operation (CRO)	I, R	I, R			
24. Count Question Resolution Operation (CQR)			I		
25. Archiving Operation (ARC)	X		I, R	X	X
Other Censuses Operations					
26. Island Areas Censuses Operation (IAC)			X		I, R
Test and Evaluation Operations					
27. Coverage Measurement Design and Estimation Operation (CMDE)					
28. Coverage Measurement Matching Operation (CMM)					
29. Coverage Measurement Field Operations (CMFO)					
30. Evaluations and Experiments Operation (EAE)		I, R	X		
Infrastructure Operations					
31. Decennial Service Center Operation (DSC)		X		I	X
32. Field Infrastructure Operation (FLDI)	X	X	X	I, R	
33. Decennial Logistics Management Operation (DLM)		X		I, R	X
34. IT Infrastructure Operation (ITIN)		X		X	X

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[5] RPO DOP version 1.0 (May 24, 2017) has a placeholder for the Data Collection IOD. When the version 2.0 RPO DOP is published, it will carry the most recent Data Collection IOD.

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7. 2020 Census Operations Top-Level Activity Tree

This supplement presents the top-level activity tree for each 2020 Census operation; this collection gives a sense of the work across the set of all operations. For each 2020 Census focus area, the top two levels of the activity tree (operation and one level down) are shown for each operation. The activity areas (i.e., the activity tree elements) represent the complete set of work that needs to be performed to conduct each operation.

An activity tree uses an outline structure to reflect the decomposition of the major operational activities in the operation. Each activity is numbered with the leading digit based on the assigned number for the operation (e.g., 1 for the Program Management operation and 8 for the Address Canvassing operation). The remainder of the activity tree numbering is according to its position in the outline. For example, for the top-level of the Address Canvassing operation (ADC), the identification of the first element is "8-1," the second element is "8-2," and so on. Activities below 8-1 at the next level of detail would be numbered beginning with 8-1.1. Further levels of detail may also exist for some parts of an activity tree. The Detailed Operational Plan for each operation includes an appendix with all detail for its activity tree.

The 2020 Census focus areas are ordered as follows:

- Program Management.
- Census/Survey Engineering.
- Frame.
- Response Data.
- Publish Data.
- Other Censuses.
- Test and Evaluation.
- Infrastructure.

7.1 Top-Level Activity Tree for the Program Management Focus Area

Figure 7 shows the Program Management focus area, the single operation that is in it (i.e., the Program Management operation), and the top-level operational activity areas that comprise the Program Management operation.
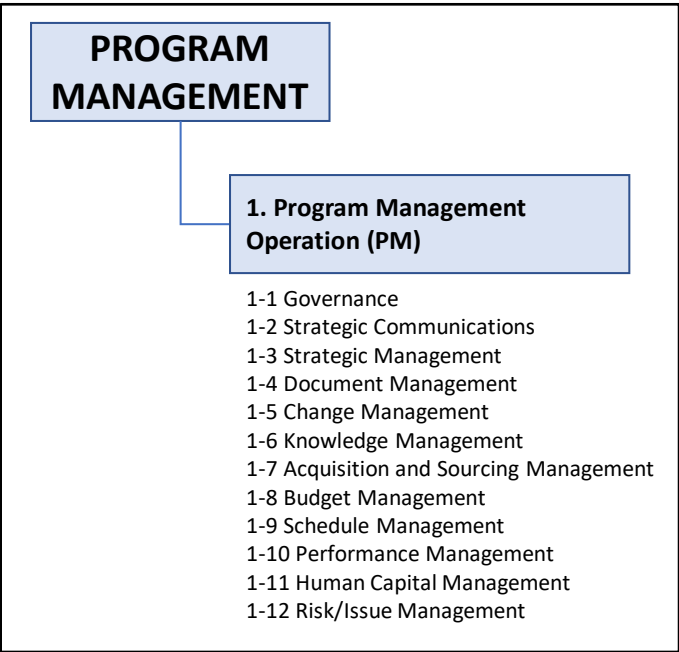
Figure 7: Summary Activity Tree for the Program Management Focus Area

7.2   Top-Level Activity Tree for the Census/Survey Engineering Focus Area

Figure 8 shows the four Census/Survey Engineering operations and the top-level operational activity areas that comprise them.

Figure 8: Summary Activity Tree for the Census/Survey Engineering Focus Area

7.3   Top-Level Activity Tree for the Frame Focus Area

Figure 9 shows the three Frame operations and the top-level operational activity areas that comprise them.

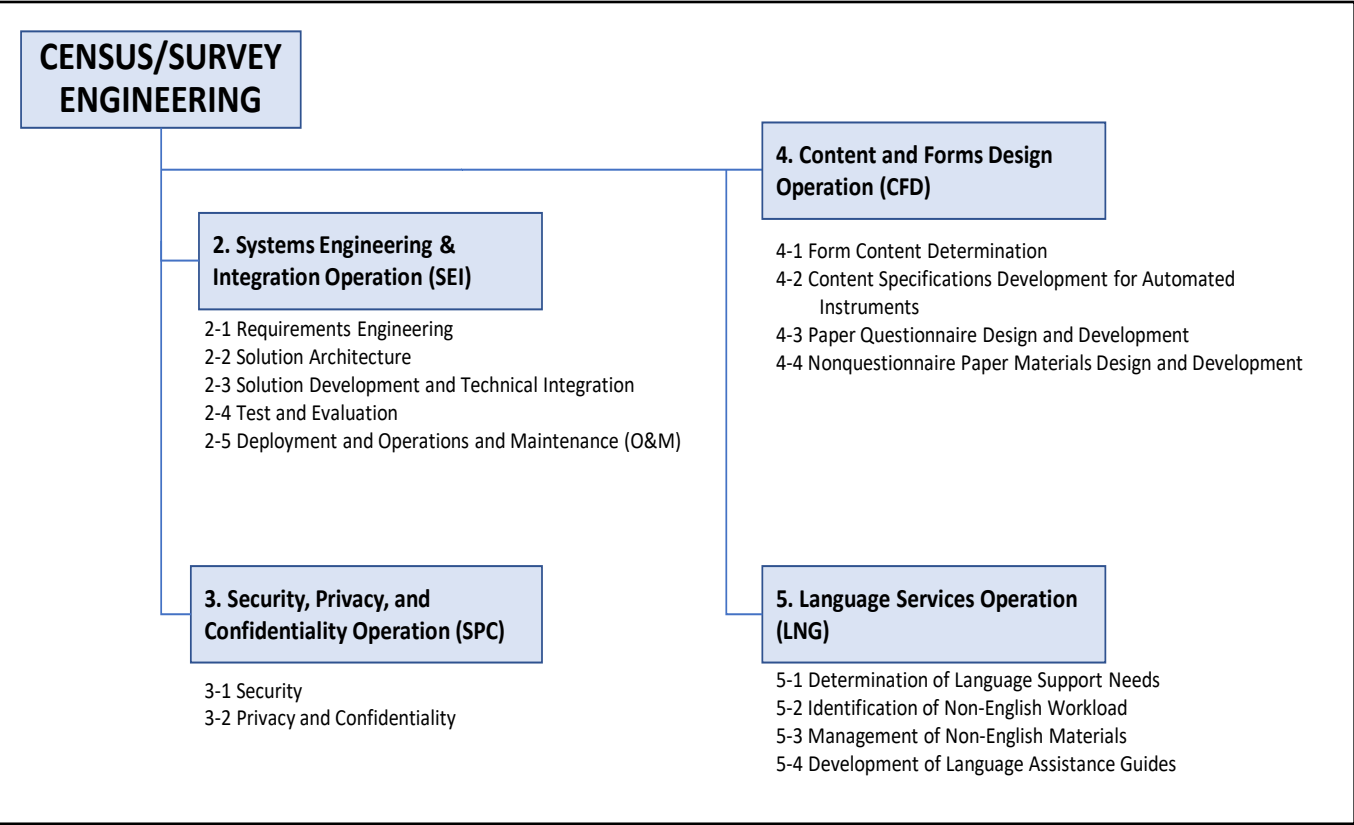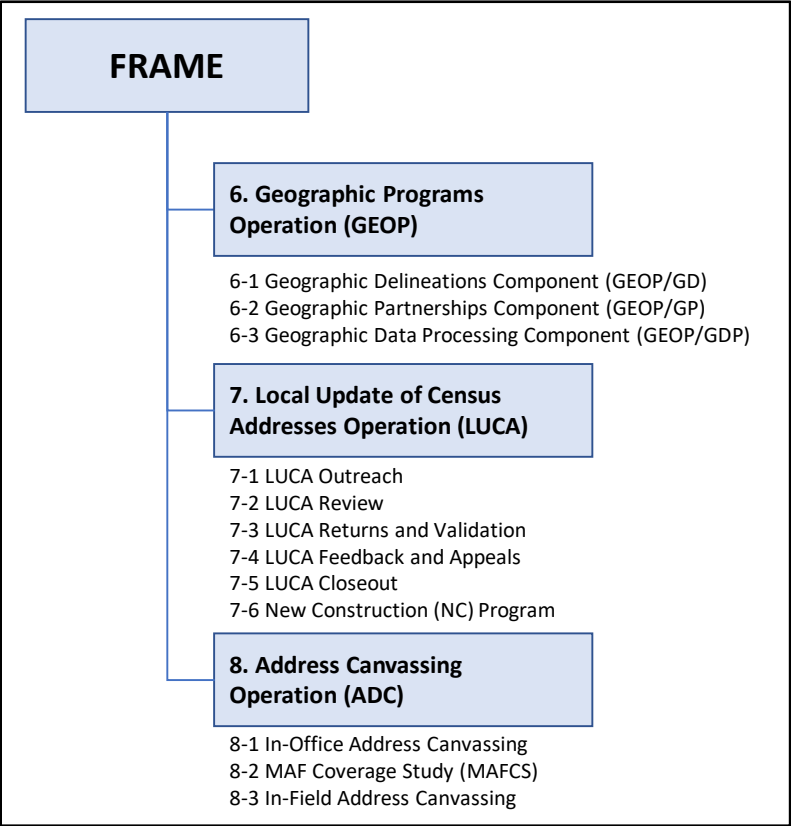**Figure 9: Summary Activity Tree for the Frame Focus Area**

7.4   Top-Level Activity Tree for the Response Focus Area

Figure 10 shows the thirteen Response Data operations and the high-level operational activity areas that comprise them.

RESPONSE DATA

9. Forms Printing and Distribution Operation (FPD)

9-1 FPD Planning and Preparation
9-2 Form Design and Address Data File Processing
9-3 Printing/Mailing
9-4 Printing
9-5 Oversight, Monitoring and Reporting

10. Paper Data Capture Operation (PDC)

10-1 PDC Universe Management
10-2 Paper Questionnaire Preparation
10-3 Paper Questionnaire Data Capture
10-4 PDC Quality Assurance Check
10-5 Data Distribution
10-6 Final Data Distribution

11. Integrated Partnership and Communications Operation (IPC)

11-1 Partnership & Comm. Program Planning
11-2 Partnership & Comm. Component Development
11-3 Partnership & Comm. Component Execution
11-4 IPC Closeout

12. Internet Self-Response Operation (ISR)

12-1 ISR Planning and Preparation
12-2 ISR Universe Management
12-3 Internet Response Data Collection

13. Non-ID Processing Operation (NID)

13-1 Real-Time Non-ID Processing Phase
13-2 Post Real-Time Non-ID Processing Phase

14. Update Enumerate Operation (UE)

14-1 UE Planning and Preparation
14-2 UE Operational Workload Management
14-3 UE Production Data Collection (TEA 2)
14-4 UE Data Collection (TEA 4)
14-5 Paper Field Materials at ACO
14-6 Paper Field Materials at NPC
14-7 UE Operation Closeout

15. Group Quarters Operation (GQ)

15-1 GQ Planning and Preparation
15-2 Progress Monitoring and Issue Resolution
15-3 GQ Advance Contact
15-4 GQ Enumeration Universe and Updates from RPO
15-5 GQ Enumeration – Field
15-6 GQ Enumeration – Electronic Response Data Transfer
15-7 Military Enumeration
15-8 Maritime Vessels Enumeration
15-9 GQ Operation Closeout

16. Enumeration at Transitory Locations Operation (ETL)

16-1 ETL Planning and Preparation
16-2 Progress Monitoring and Issue Resolution
16-3 ETL Advance Contact
16-4 ETL Enumeration Universe and Updates from RPO
16-5 ETL Enumeration
16-6 ETL Operation Closeout

17. Census Questionnaire Assistance Operation (CQA)

17-1 CQA Planning and Preparation
17-2 Inbound Calling Operations
17-3 Outbound Calling Operations
17-4 Webchat Support
17-5 CQA Quality Assurance
17-6 Oversight, Monitoring, and Reporting
17-7 CQA Operation Closeout

18. Nonresponse Followup Operation (NRFU)

18-1 NRFU Planning and Preparation
18-2 NRFU Operational Workload Management
18-3 NRFU Data Collection
18-4 NRFU Quality Control Adjudication
18-5 NRFU Operation Closeout

19. Response Processing Operation (RPO)

19-1 RPO Pre-Data Collection Phase
19-2 RPO Data Collection Phase
19-3 RPO Post-Data Collection Phase

20. Federally Affiliated Count Overseas Operation (FACO)

20-1 FACO Planning and Preparation
20-2 FACO Response Collection
20-3 FACO Final Outputs
20-4 FACO Closeout

35. Update Leave Operation (UL)

35-1 UL Planning and Preparation
35-2 UL Operational Workload Management
35-3 UL Data Collection
35-4 UL Operation Closeout

Figure 10: Summary Activity Tree for the Response Data Focus Area

7.5 Top-Level Activity Tree for the Publish Data Focus Area

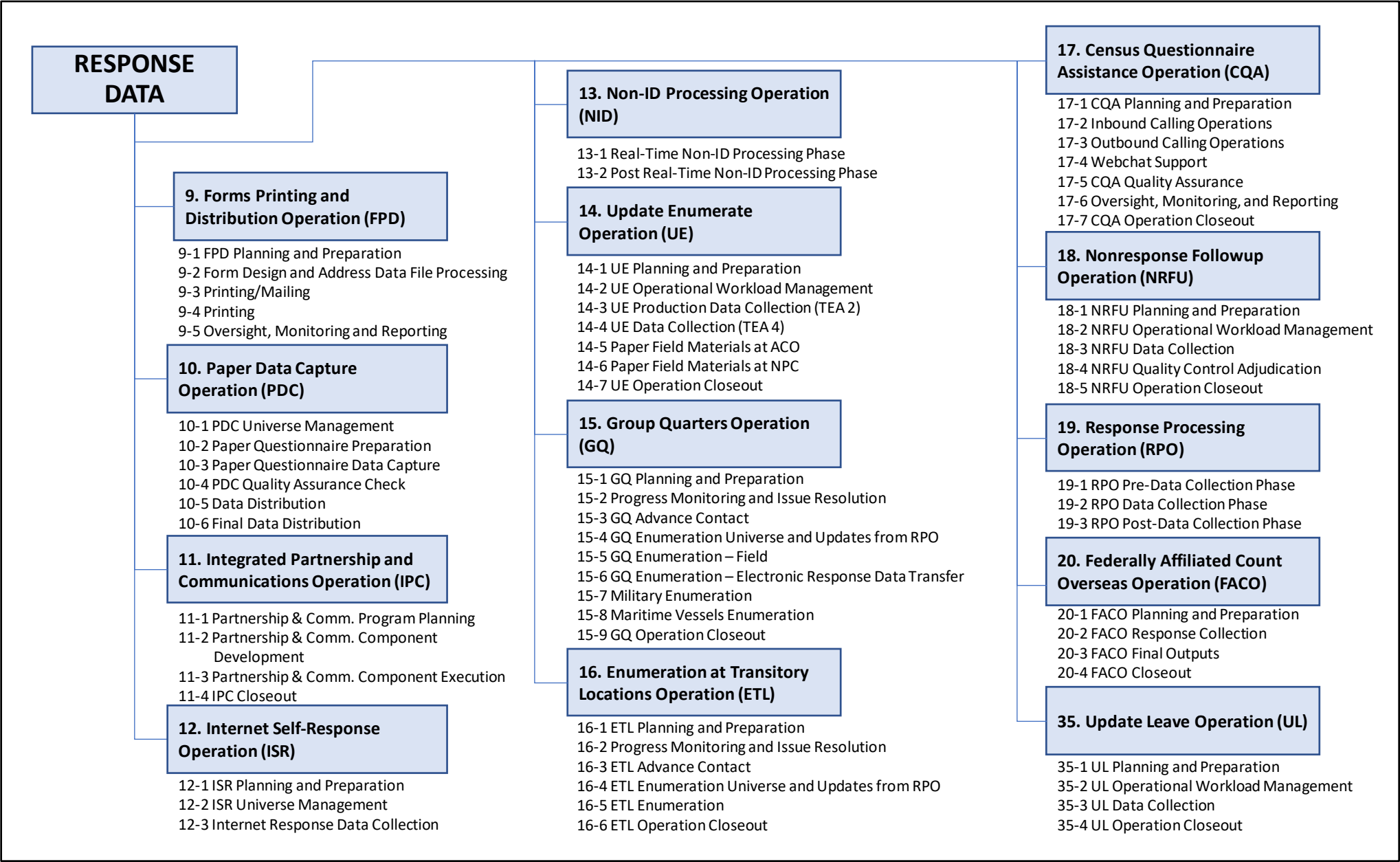Figure 11 shows the five Publish Data operations and the top-level operational activity areas that comprise them.
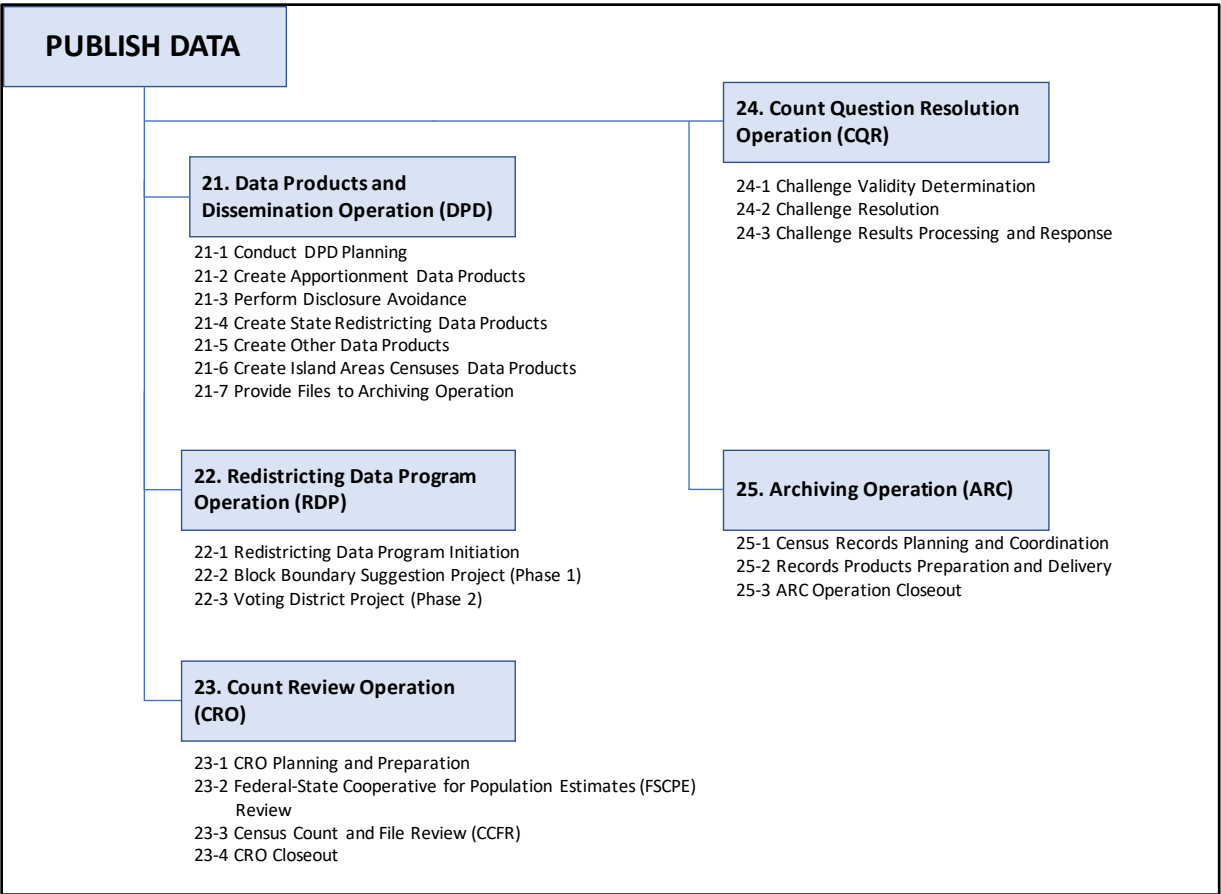
PUBLISH DATA

21. Data Products and Dissemination Operation (DPD)
21-1 Conduct DPD Planning
21-2 Create Apportionment Data Products
21-3 Perform Disclosure Avoidance
21-4 Create State Redistricting Data Products
21-5 Create Other Data Products
21-6 Create Island Areas Censuses Data Products
21-7 Provide Files to Archiving Operation

22. Redistricting Data Program Operation (RDP)
22-1 Redistricting Data Program Initiation
22-2 Block Boundary Suggestion Project (Phase 1)
22-3 Voting District Project (Phase 2)

23. Count Review Operation (CRO)
23-1 CRO Planning and Preparation
23-2 Federal-State Cooperative for Population Estimates (FSCPE) Review
23-3 Census Count and File Review (CCFR)
23-4 CRO Closeout

24. Count Question Resolution Operation (CQR)
24-1 Challenge Validity Determination
24-2 Challenge Resolution
24-3 Challenge Results Processing and Response

25. Archiving Operation (ARC)
25-1 Census Records Planning and Coordination
25-2 Records Products Preparation and Delivery
25-3 ARC Operation Closeout

Figure 11: Summary Activity Tree for the Publish Data Focus Area

7.6 Top-Level Activity Tree for the Other Censuses Focus Area

Figure 12 shows the Other Censuses focus area, the single operation that is in it (i.e., the Island Areas Censuses operation), and the top-level operational activity areas that comprise the Island Areas Censuses operation.
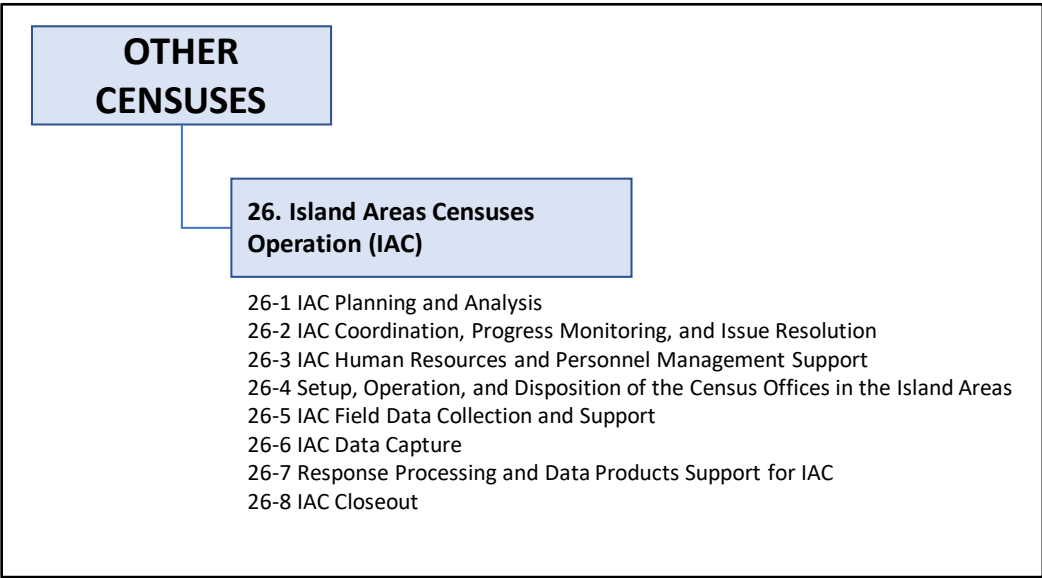
OTHER CENSUSES

26. Island Areas Censuses Operation (IAC)
26-1 IAC Planning and Analysis
26-2 IAC Coordination, Progress Monitoring, and Issue Resolution
26-3 IAC Human Resources and Personnel Management Support
26-4 Setup, Operation, and Disposition of the Census Offices in the Island Areas
26-5 IAC Field Data Collection and Support
26-6 IAC Data Capture
26-7 Response Processing and Data Products Support for IAC
26-8 IAC Closeout

Figure 12: Summary Activity Tree for the Other Censuses Focus Area

7.7 Top-Level Activity Tree for the Test and Evaluation Focus Area

Figure 13 shows the four Test and Evaluation operations and the top-level operational activity areas that comprise them.
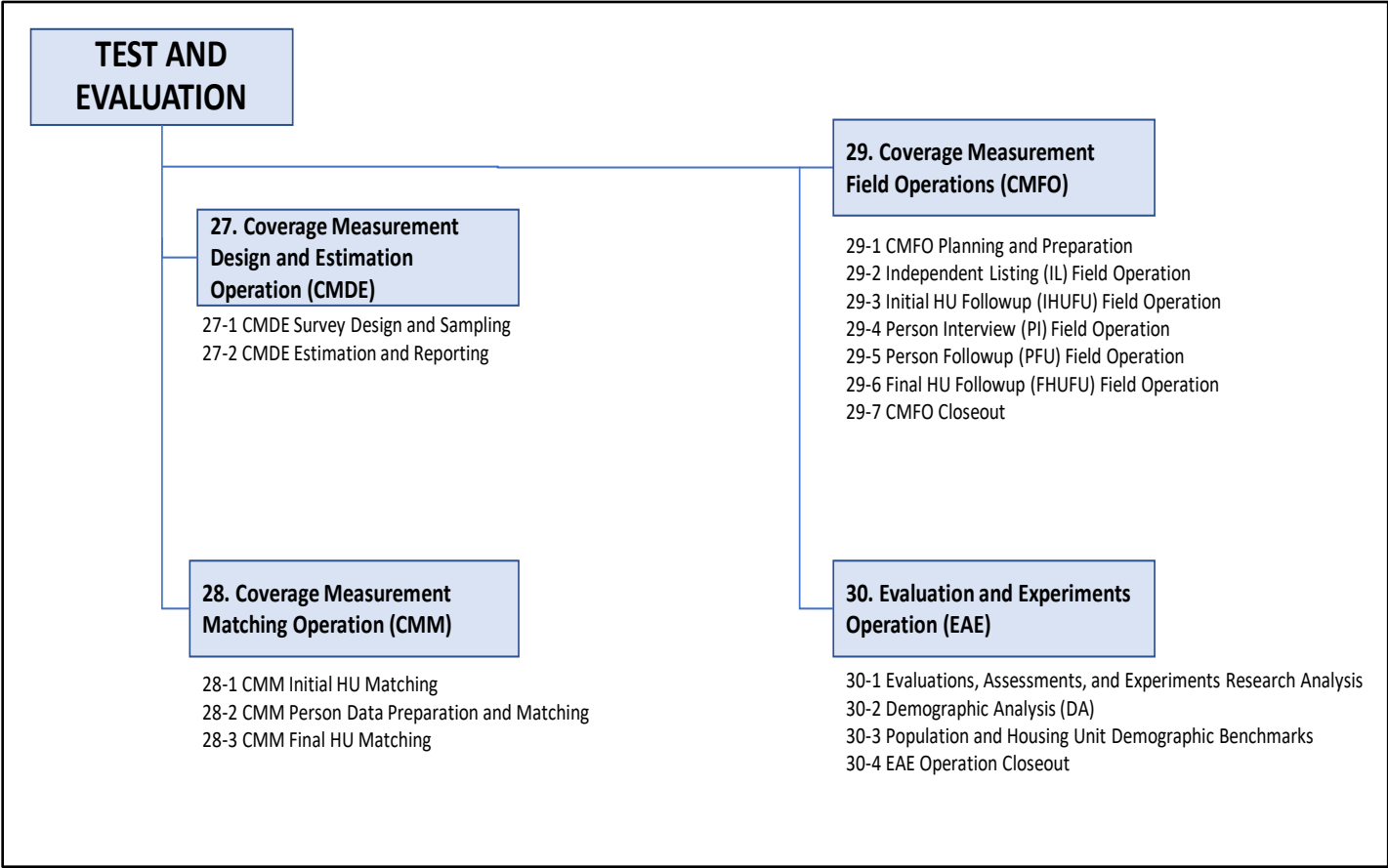

Figure 13: Summary Activity Tree for the Test and Evaluation Focus Area

7.8 Top-Level Activity Tree for the Infrastructure Focus Area

Figure 14 shows the four Infrastructure operations and the top-level operational activity areas that comprise them.
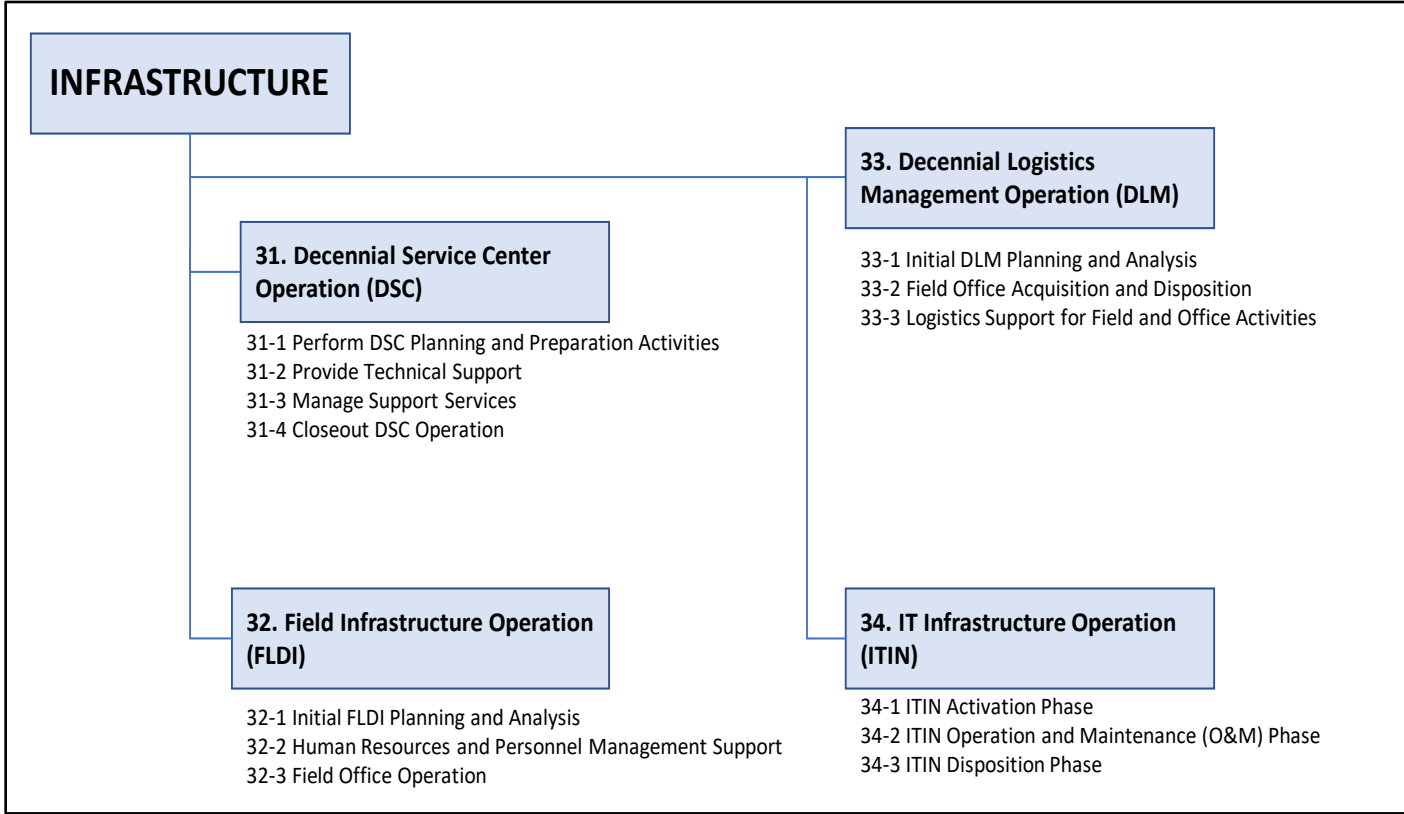

Figure 14: Summary Activity Tree for the Infrastructure Focus Area

Acronyms

Table 2 lists the acronyms and abbreviations used within this supplemental document.

<p align="center">Table 2: Acronyms and Abbreviations List</p>

Acronym	Meaning
ACO	Area Census Office
ADC	Address Canvassing Operation
AR	Administrative Records and Third-Party Data
ARC	Archiving Operation
BCU	Basic Collection Unit
CCFR	Census Counts and File Review
CDAR	Center for Disclosure Avoidance Research
CEF	Census Edited File
CFD	Content and Forms Design Operation
CI	Coverage Improvement
CMDE	Coverage Measurement Design and Estimation Operation
CMFO	Coverage Measurement Field Operations
CMM	Coverage Measurement Matching Operation
CQA	Census Questionnaire Assistance Operation
CQR	Count Question Resolution Operation
CRO	Count Review Operation
CUF	Census Unedited File
DA	Demographic Analysis
DLM	Decennial Logistics Management Operation
DOP	Detailed Operational Plan

Acronym	Meaning
DPD	Data Products and Dissemination Operation
DRF	Decennial Response File
DRP	Decennial Response Processing
DSC	Decennial Service Center Operation
DSF	Delivery Sequence File
E2E	End-to-End
EAE	Evaluations and Experiments Operation
ETL	Enumeration at Transitory Locations Operation
FACO	Federally Affiliated Count Overseas Operation
FHUFU	Final Housing Unit Followup
FLDI	Field Infrastructure Operation
FPD	Forms Printing and Distribution Operation
FSCPE	Federal-State Cooperative for Population Estimates
FV	Field Verification
GD	Geographic Delineations
GDI	Geographic Data Integration
GDP	Geographic Data Processing
GEO	Geography Division
GEOP	Geographic Programs Operation
GP	Geographic Partnerships
GQ	Group Quarters [Type of Living Quarters]
GQ	Group Quarters Operation
GSS	Geographic Support System Program

Acronym	Meaning
GU	Governmental Unit
HU	Housing Unit
IAC	Island Areas Censuses Operation
IHUFU	Initial Housing Unit Followup
IL	Independent Listing
IOD	Integrated Operations Diagram
IPC	Integrated Partnership and Communications Operation
ISR	Internet Self-Response Operation
IT	Information Technology
ITIN	Information Technology Infrastructure Operation
IVR	Interactive Voice Response
LNG	Language Services Operation
LUCA	Local Update of Census Addresses Operation
MAF	Master Address File
MAF/TIGER	Topologically Integrated Geographic Encoding and Referencing System
MAFCS	MAF Coverage Study
MAFX	MAF Extract
NARA	National Archives and Records Administration
NC	New Construction Program
NID	Non-ID Processing Operation
NPC	National Processing Center
NRFU	Nonresponse Followup Operation
O&M	Operations and Maintenance

Acronym	Meaning
ODI	Operational Design Integration
OMB	Office of Management and Budget
PDC	Paper Data Capture Operation
PES	Post Enumeration Survey
PFU	Person Followup
PI	Person Interview
PM	Program Management Operation
QC	Quality Control
RCC	Regional Census Center
RDI	Response Data Integration
RDP	Redistricting Data Program Operation
RI	Reinterview
RPO	Response Processing Operation
SBE	Service Based Enumeration
SEI	Systems Engineering and Integration Operation
SPC	Security, Privacy, and Confidentiality Operation
TEA	Type of Enumeration Area
TL	Transitory Location
TU	Transitory Unit
UAA	Undeliverable as Addressed
UC	Universe Creation
UE	Update Enumerate Operation
UL	Update Leave Operation

Acronym	Meaning
UM	Universe Management
USPS	United States Postal Service